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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,009	03/29/2006	Yoshiyuki Odagawa	2593-0162PUS1	4341
2292 7590 11/06/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER KRYLOVA, IRINA				
ART UNIT 4131		PAPER NUMBER		
NOTIFICATION DATE 11/06/2008		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/574,009

Applicant(s)

ODAGAWA ET AL.

Examiner

IRINA KRYLOVA

Art Unit

4131

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/88)
Paper No(s)/Mail Date 06/29/2006; 03/29/2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required. Claims 1-3 specify the content of carboxyl groups in both nitrile rubber and acrylic polymer in terms of "equivalents per 100 g". The specification does not provide a method for calculation of the "equivalents" and does not specify "per 100 g" of what.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Toya et al** in WO 03/046073 in view of **Fujii et al** in US 6,410,653 and in further view of **Fuller** in 6,057,014.

4. **Toya et al** discloses a rubber vulcanizate comprising:

1) 40-90% wt of a nitrile group-containing copolymer rubber;

2) 60-10%wt of an acrylic resin containing not larger than 0.01 equivalents of a crosslink-forming functional group per 100 g of resin; the crosslink-forming group comprises a carboxylic group;

3) vulcanizer (Abstract).

The nitrile rubber comprises a copolymer of alpha-beta-ethylenically unsaturated nitrile monomer with alpha-beta ethylenically unsaturated dicarboxylic acid monoalkyl esters ([0014]-[0015]).

The acrylic resin comprises a copolymer of at least one of methyl acrylate or methyl methacrylate ([0020]). The crosslink-forming functional group can be introduced into the acrylic resin by copolymerizing a monomer having a crosslink-forming group such as acrylic acid or methacrylic acid ([0022]).

The vulcanizer comprises a polyamine having at least two amino groups ([0034]).

The rubber vulcanizates are used for making industrial parts such as rolls, hoses, belts and sealing members ([0067]).

5. **Toya et al** fails to specify the content of carboxyl groups in nitrile rubber and an amount of polyamine vulcanizer for cross-linking carboxyl groups.

6. **Fujii et al** discloses a carboxylated nitrile group containing rubber obtained by copolymerizing an ethylenically unsaturated nitrile, a diene and monoalkylesters of unsaturated dicarboxylic acid, having an **acid equivalent being 0.005 to 0.03 equivalents per 100 g of rubber** (col. 4, lines 25-38; col. 8, lines 65-67).

7. **Fuller** discloses **carboxylated polymeric adducts**, obtained by reacting a polymer having unsaturation in the backbone with an unsaturated dicarboxylic acid or anhydride, **cross-linked with polyamine compounds** (col. 1, lines 45-60). The amount of polyamino compound is taken so that **equal to or greater than amount necessary to completely react with the free carboxylic acid** of the polymer, generally **1.25-2.0 equivalents of polyamine per equivalent of carboxyl groups** (col. 3, lines 55-68; col. 4, lines 1-10).

8. Since **Fujii et al** discloses substantially the same carboxylated nitrile rubber, as **Toya et al**, but specifies the content of carboxyl group being 0.005-0.03 equivalents per 100 g of rubber to provide rubber having high strength and abrasion resistance properties, therefore, it would be obvious to one skilled in the art at the time of the invention was made to use the carboxylated nitrile rubber of **Fujii et al** in the composition of **Toya et al** to produce rubber with properties mentioned above.

9. Since **Fuller** recites the process for cross-linking carboxyl group-containing rubbers using polyamine cross-linking agent and specifically states that the amount of the cross-linker should be taken to ensure full reaction of the carboxyl groups and provides the ratio of 1.25-2.0 equivalents of polyamine per equivalent of carboxyl groups (which falls within the limits claimed in the instant invention), therefore, it would be obvious to one skilled in the art at the time of the invention was made to use the

specified ratio of cross-linker to carboxyl groups, given by **Fuller**, to ensure the cross-linking of the rubber composition of **Toya et al**.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Toya et al** in WO 03/046073 in view of **Fujii et al** in US 6,410,653 and in further view of **Fuller** in 6,057,014, as was used for rejection of claim 1, in further view of **Schaffer et al** in US 5,124,181.

11. **Toya et al** fails to specify acrylic resin having alpha-beta ethylenically unsaturated dicarboxylic acid monoester unit.

12. **Schaffer et al** discloses acrylic copolymer comprising alkyl methacrylate and monoester of ethylenically unsaturated dicarboxylic acid (Abstract).

14. Since **Schaffer et al** provides a specific acrylic copolymer of methacrylate and monoester of ethylenically unsaturated dicarboxylic acid, having free carboxyl groups, and, besides, these copolymers are widely used in the art, therefore, it would be obvious to one skilled in the art at the time of the invention was made to use any carboxyl group containing acrylic resin, including the acryl copolymer having free carboxyl groups of **Schaffer et al**, in the composition of **Toya et al** to produce rubber cross-linked with polyamines.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. European patent application EP 1,234,851 by Mori et al discloses crosslinkable nitrile rubber composition cross-linked with polyamine. Japanese patent application JP 2002-080812 discloses a composition comprising a mixture of carboxyl group containing acrylic rubber, having carboxyl group content from 0.05-2%wt, and nitrile rubber in weight ratio 5/95 to 95/5.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IRINA KRYLOVA whose telephone number is (571)270-7349. The examiner can normally be reached on Monday-Friday 7:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571)272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/
Supervisory Patent Examiner, Art Unit 4131

/I. K./
Examiner, Art Unit 4131